



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,036	01/25/2006	Giuseppe Coppola	1333013	9303
7590 Hedman & Costigan 1185 Avenue of the Americas New York, NY 10036-2646			EXAMINER BOUTSIKARIS, LEONIDAS	
			ART UNIT 2872	PAPER NUMBER
			MAIL DATE 09/05/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,036	Applicant(s) COPPOLA ET AL.	
	Examiner Leo Boutsikaris	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-14 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/25/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Allowable Subject Matter

Claims 1-14 are allowable over the prior art of record for at least the reason that even though the prior art discloses a method for reconstructing an image from a digital hologram, wherein the convolution transform of the digitized hologram is performed to produce an expanded size array compared to that corresponding to the digitized hologram, the prior art fails to teach or reasonably suggest a method for the reconstruction of holographic images, wherein the second step is carried out through discrete Fresnel transform starting from an array of V_e values, wherein $V_e > V_r$, as set forth by the claimed combination.

Kreis (SPIE Proceedings article) discloses a method for reconstructing images from digital holograms, wherein a Fresnel transform or a convolution approach are applied to the digitized recorded hologram, producing an array that reconstructs the image. However, Kreis teaches that the "embedding" of the "signal" holographic pattern into a larger array comprising pixels having constant intensity value is used only for the case where the convolution approximation is used for the reconstruction of the wave field, not the Fresnel approximation, as

Art Unit: 2872

it is the case in the claimed invention. Furthermore, the above two methods are completely different regarding the sizes of the reconstruction pixels (see Abstract).

Cuche (US 6,262,818) discloses a method of reconstructing an image from a digital hologram comprising adjusting various reconstruction parameters for the correction of phase aberrations.

Finally, Bernhardt (Optics Communications article) discloses a method for computing a digital Fresnel hologram of a target image, wherein the target image matrix is enlarged by including zero intensity pixels. It is noted that the above is the opposite of the claimed invention where a method for the reconstruction of an image from a digitized hologram is disclosed.

Conclusion

This application is in condition for allowance except for the following formal matters:

In claim 1, lines 4-5, the phrase “a number V_r of signal intensity values corresponding to as many elementary sib-images of “pixels” of the holographic image sampling intervals” should be changed to “a number V_r of elementary pixels”, for better clarity.

In claim 1, line 7, the phrase “complex plane” should be changed to “image plane”, since it is the image plane where the image is reconstructed.

In claim 1, line 10, the relation “ $p = V_e - V_r > 0$ ” must be rewritten correctly.

In claim 1, line 11, “OS” must be defined or deleted.

In claim 1, line 11, the phrase “corresponding to as many pixels of sizes equal to the ones of the others” needs to be rewritten or deleted, because it is confusing.

Art Unit: 2872

In claim 2, line 2, the phrase "said p constant values are null b]values (OS=0)" should be rewritten as "said p values are zero".

In claim 7, line 2, the parameters Nr and Mr need to be defined.

In claim 8, the parameters Ne, Me, need to be defined.

In claim 9, line 2, it is unclear whether the parenthesis enclosing " $\Delta\xi = \Delta x, \Delta\eta = \Delta y$ " represents a separate limitation or it is part of the previous formula.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 25 USPQ 74, 453 O.G. 213, (Comm'r Pat. 1935).

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Leo Boutsikaris whose telephone number is 571-272-2308. The examiner can normally be reached on M-F, 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephone Allen can be reached on 571-272-2434. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

Art Unit: 2872

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Leo Boutsikaris, Ph.D., Esq.
Primary Patent Examiner, AU 2872
August 29, 2007



LEONIDAS BOUTSIKARIS
PRIMARY EXAMINER